



**Massachusetts Bay
Transportation Authority**

Safety Update

Fiscal and Management Control Board

September 14, 2020

Ronald Ester, Chief Safety Officer

Agenda

- Safety Goals
- Transit Safety Plan Update
- Safety Performance Update
 - Next Steps



Safety Management System

MANAGEMENT POLICY
RISK MANAGEMENT
ASSURANCE
PROMOTION



MBTA Safety Goals

- Support the rollout and implementation of SMS and the Transit Safety Plan
- Increase the visibility of Safety
 - Safety presence on all shifts
- Improve safety reporting
 - Improve the delivery of timely safety data and trends
 - Safety reporting at all levels of the organization
- Implement enhanced/improved Event Investigation process and procedures
 - Finalize and promote Event Investigation Manual and conduct training
 - Improve reporting, timeliness of investigations, and report preparation
 - Measure and report on investigation process
- Continue to build and improve effectiveness of the Safety Department
- Safety Performance Improvement



Transit Safety Plan Update

- MBTA Transit Safety Plan Update
 - § 49 CFR 673.11(a) requires that MBTA develop a Transit Safety Plan that is certified by our State Safety Oversight Agency – the Department of Public Utilities (DPU)
 - Due to COVID-19, FTA extended the compliance deadline to December 31, 2020
 - June 22, 2020, MBTA Safety presented the Transit Safety Plan to the Board and the Board voted to approve
 - June 25, 2020, MBTA submitted the Transit Safety Plan to the DPU
 - July 16, 2020, DPU approved and certified the MBTA's 2020 Transit Safety Plan
 - MBTA is working to implementing SMS Authority-wide
 - Transit Safety Plan will continue to be updated annually as SMS implementation matures



Measuring Safety Performance

- FTA Public Transportation **Agency Safety Plan** Rule (49 CFR 673) requires transit agencies to set targets for the following four KPIs:
 - **Fatalities** – all deaths on our property (including intentional) w/in 30 days excluding death due to illness and other natural causes
 - **Injuries** – harm on our property resulting in immediate medical transport from scene
 - **System Reliability** – mean distance between major mechanical failure
 - **Safety Events** – incidents (including accidents and derailments) meeting NTD major reporting thresholds for transit rail, bus, and paratransit

NOTE: 49 CFR 673 excludes Commuter Rail and Ferry



MBTA's Safety Performance Measures and Targets

Safety Performance Targets

Safety performance targets based on the safety performance measures established under the National Public Transportation Safety Plan.

Mode of Transit Service	Fatalities (Total)	Fatalities (Rate per 1 million revenue miles)	Injuries (Total)	Injuries (Rate per 1 million revenue miles)	Safety Events (Total)	Safety Events (Rate per 1 million revenue miles)	System Reliability (Revenue miles traveled per major mechanical failure)
Heavy Rail	0	0	221	9.45	24	1.00	47,000
Light Rail	0	0	100	17.25	34	5.83	7,000
Bus	0	0	367	15.50	142	6.00	18,000
The RIDE	0	0	36	2.30	37	2.22	66,000

Safety Performance – Target Setting for Initial Rollout

- FTA requirements and guidance:
 - 49 CFR 673 references the National Safety Plan (NSP) for required safety performance indicators, metrics, and targets
 - Indicators are based on NTD reporting requirements
 - “moving toward zero” for fatalities and improving the annual performance of other KPIs by 2% to 5% are acceptable targets in this initial year
- MBTA Target Basis:
 - MBTA safety performance indicators and targets for 2020 are based FTA webinar guidance, past performance, industry best practices, and related discussions
 - 5% reduction based on historical performance for safety events and injuries is an acceptable target for the initial rollout of safety targets
 - In cases where previous years of performance exceeded 5% reduction, the targets were set at the lowest annual performance in last 3 years
 - Based on improvements in data collection in recent years, MBTA is using the past 3 years of data to set targets (2017-2019)
- Initial target setting completed this year will provide a baseline on safety performance and targets that will be re-evaluated annually



Mandated Performance Targets - Fatalities

A fatality meets the threshold for reporting if it occurs on our property and is confirmed within 30 days.

Fatalities – Rate per million vehicle revenue miles				
	3 Year Average (2017-2019)	Annual Performance Target	Basis for Proposed Target	2020 Performance thru July
Heavy Rail	0.04	0	Move to zero	0
Light Rail	0.06	0	Move to zero	0
Bus	0.04	0	Move to zero	1
The RIDE	0.02	0	Move to zero	0



Mandated Performance Targets - Injuries

An injury (of customer, employee, or member of the public) meets the threshold for reporting if it requires transport away from the scene for medical attention for one or more persons.

NTD Reportable Injuries – Rate per million vehicle revenue miles				
	3 Year Average (2017-2019)	Annual Performance Target	Basis for Proposed Target	2020 Performance thru July
Heavy Rail	9.95	9.45	5% reduction	6.68
Light Rail	18.16	17.25	5% reduction	6.90
Bus	16.31	15.5	5% reduction	10.11
The RIDE	2.43	2.3	5% reduction	1.75



Mandated Performance Targets – System Reliability

Reliability is measured as the mean distance between major mechanical failure by mode. Major mechanical system failures prevent a vehicle from completing or starting up a scheduled revenue trip because actual movement is limited or because of safety concerns.

System Reliability - Revenue miles traveled per major mechanical failure				
	3 Year Average (2017-2019)	Annual Performance Target	Basis for Proposed Target	2020 Performance thru July
Heavy Rail	49,732	47,000	Improvement over 2019 performance with move toward 3 year avg.	50,173
Light Rail	7,660	7,000	Improvement over 2019 performance with move toward 3 year avg.	7,908
Bus	19,451	22,000	12% improvement over 2019 performance	36,100
The RIDE	66,134	66,000	Improvement over 2019 performance with move toward 3 year avg.	Pending



Mandated Performance Targets – NTD Reportable Safety Events

An event is considered a **safety event** if it meets the reporting thresholds for collisions, derailments, fire, hazardous material spill, act of nature (Act of God), evacuation, or Other Safety Occurrence Not Otherwise Classified occurring on a transit right-of-way, in a transit revenue facility, in a transit maintenance facility, or involving a transit revenue vehicle and meeting a NTD Major event threshold.

NTD Reportable Safety Events – Rate per million vehicle revenue miles				
	3 Year Average (2017-2019)	Annual Performance Target	Basis for Proposed Target	2020 Performance thru July
Heavy Rail	1.06	1	5% reduction	1.10
Light Rail	6.13	5.83	5% reduction	4.20
Bus	6.32	6	5% reduction	4.45
The RIDE	2.34	2.22	5% reduction	2.14



Overview of Additional KPIs

- Additional Proposed Measures and Targets by Mode and Line *not required by 49 CFR 673*
- These metrics were developed to get a more in-depth analysis of anecdotal areas of concern that fall outside of the FTA mandated requirements
- Metrics have been customized to ensure that they are useful and focused on ensuring safe operation for our customers and employees
 - Customer Injuries – rate per passenger trips
 - Derailments
 - Mainline Revenue Passenger Train Derailments
 - Mainline Non-revenue Passenger Train Derailments
 - Yard/Shop Passenger Train Derailments
 - Transit Vehicle Collisions
 - Reportable Fire/Smoke Incidents



Proposed Additional Measures and Targets (not required by FTA)

Rail - Additional Metrics and Targets				
	3 Year Average (2017-2019)	Annual Performance Target	Basis for Proposed Target	2020 Performance thru July
Customer Injuries (per million passenger trips)	1.3	1.2	5% reduction	2.2
Main Line Train Derailments (total)	5	3	Reduce to 2017 performance	4
Yard Train Derailments (total)	9	9	Reduce to average	3
Collisions (per million revenue miles)	1.8	1.7	5% reduction or	1.18
Reportable Fire/Smoke Incidents (total)	194	170	5% reduction from 2019 performance	102



Proposed Additional Measures and Targets (not required by FTA)

Bus - Additional Metrics and Targets				
	3 Year Average (2017-2019)	Annual Performance Target	Basis for Proposed Target	2020 Performance as of July
Customer Injuries (per million passenger trips)	2.5	2.4	5% reduction from average	2.54
Collisions (per million revenue miles)	87.5	87.5	Reduce to average	58.88
Reportable Fire/Smoke Incidents (total)	24	15	5% reduction from 2019 performance	9



Conclusion

- Utilize current data trends to improve system performance
- Continue developing Safety Risk Management processes and Authority-wide implementation
- Continue to drill down on data to determine root causes
 - Develop additional metrics addressing historic areas of concern
 - Utilize interdepartmental collaboration to develop mitigations and corrective actions
 - Conduct Safety Assurance on implemented mitigations

